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SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE

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Island Volcano

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A SCIENCE SERVICE PUBLICATION

CHEMISTRY

Oil Being Formed Now

Radioactive carbon shows that marine sediments are accumulating in tidelands. Oldest frozen meat, Mayan calendar and Isaiah manuscript among other datings.

➤ OIL IS being formed now in off-shore tidelands waters. The idea that nature needs a million years or more to manufacture our vast petroleum resources is an exploded scientific theory as the result of new radiocarbon dating findings reported to the American Chemical Society meeting in Atlantic City.

Dr. J. L. Kulp of Columbia University's Lamont Geological Observatory, Palisades, N. Y., told of the success of Dr. Paul Smith of the Esso Laboratories in finding in marine sediments appreciable hydrocarbons accumulating at the present time. This accounts for the way oil has been formed in the past.

The formation of oil at the present time solved one of the prime geological mysteries. It was proved by measurement of the radioactivity of the deposit. Newly-formed carbon compounds give off more radiation due to incorporation in them of carbon 14.

The younger radiocarbon does not have time to decay so much after its formation by cosmic rays in the upper air.

The oldest frozen meat in the world is over 28,000 years old. It is the flesh of a superbison preserved in the permanently frozen ground of northern Alaska. This naturally refrigerated meat is probably older, as its age was beyond the reach of the radiocarbon dating method. It is nearly three times as old as the earliest evidence of man yet obtained on the North American continent. Dogs and men feasted upon such ancient bison meat when it was uncovered from its frozen locker.

Another result of radiocarbon dating announced by Dr. Kulp seems to have settled the controversy over the Mayan calendar. The ancient peoples of Mexico and Central America had a very accurate system of dates, but the correlations with the modern calendar differ by 200 years. Now the Spinden correlation has been proved correct since a beam over a doorway with a Mayan date upon it has been dated at 1,470 years ago. This makes the Mayan civilization more ancient.

The recently discovered manuscript scroll of the Old Testament book of Isaiah is a genuine antique and not a medieval forgery, another radiocarbon dating proved, although the method does not have sufficient precision to tell whether it was written a century or two B.C. or in the second century A.D.

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CHEMISTRY

New Waterproofing Dye

➤ BECAUSE A dye-spotted rag was used to mop up water spilled on the laboratory floor, a chemist reported to the American Chemical Society in Atlantic City that dyes that both color fabrics and make them water-repellent have been developed.

The double-duty dyes increase the water repellency of wool 60 times and cotton 12 times. They color as well as protect against water. Dr. Clyde C. DeWitt, director of Michigan State College's engineering experiment station, who developed the dye-waterproofers, predicted they will be used in awnings, tents and umbrellas.

The new dyes should also make clothes and other wool and cotton articles more durable since they lubricate the fabric and keep moisture out.

While Dr. DeWitt and a graduate student were working in 1947 on flotation of a copper ore, they used a dye that had some of the properties of a mineral oil. Some spilled dye was cleaned up with a white cloth. When the spotted cloth was used to mop up water later, it was discovered that the dyed spots resisted wetting and that the qualities of mineral oils were incorporated into the dye. A new dye-making process was developed as a consequence.

The water-repellent properties last in the material as long as the dye, whereas most waterproofing materials are taken out by dry cleaning. It may be necessary to change present dry cleaning materials to clean double-duty dyed fabrics.

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PHYSIOLOGY

Shiver-Stopping Center In Brain Is Discovered

➤DISCOVERY of a shivering stopper in the brain was announced by Drs. Allan Hemingway and Paul Forgrave of the University of California at Los Angeles Medical School at the meeting of the American Physiological Society in New Orleans.

The shivering stopper, or shivering-suppressor center, is located in the hypothalamus, a part of the brain near the attachment of the spinal cord. It gives a means of suddenly stopping shivering which has started. This shivering-suppressor center may be what stops shivering in muscles needed to make a voluntary movement of arms or legs or fingers or other parts of the body. Otherwise the muscles would be shivering while the movement was in progress, and this would result in jerky uncoordinated movement.

The purpose of shivering is to generate heat by muscular movement in an attempt to keep body temperature from falling.

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BIOCHEMISTRY

Medical Uses Seen For Sugar Beet Juice

➤ SUGAR BEET juice contains two substances which may find important roles in nutrition, Robert J. Brown and Robert F. Serro of the Great Western Sugar Company, Denver, Colo., told the American Chemical Society meeting in Atlantic City. They are inositol, a vitamin-like material, and galactinol, which is believed to be the first natural compound of inositol with a sugar. Inositol is a possible preventive of hardening of the arteries and it has been used in treatment of liver ailments.

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ASTRONOMY

Accidental Star Birth When Gases Meet

➤ A STAR begins to be created largely by accident, when interstellar gases in a cloud are brought together unevenly. Next the embryo star grows rapidly, adding to its mass by picking up other gases as it makes its way through the cloud.

Thus did Prof. Fred Hoyle of St. John's College, Cambridge, England, picture the birth of a star to members of the International Astronomical Union meeting in Rome.

Eventually the star moves out of its parent cloud and into a space which is irregularly dotted with clouds of gas.

"About one star in a hundred will experience a second period of rapid growth by accretion," Prof. Hoyle estimates. "One star in a million will experience both a second and a third such period."

Those stars that pass through a second cloud in addition to the one in which they happened to condense become moderately large. The three-period stars are the highly exceptional stars of a very large mass, the British astronomer pointed out.

Two embryo stars that team up when they are some six hundred billion miles apart, and both are only about one-tenth the size of the sun, can evolve either into twin stars about the size of the sun that you can spot as double with the naked eye, or into stars each five times the sun's mass that are so close together they are never seen as double, Prof. Hoyle stated.

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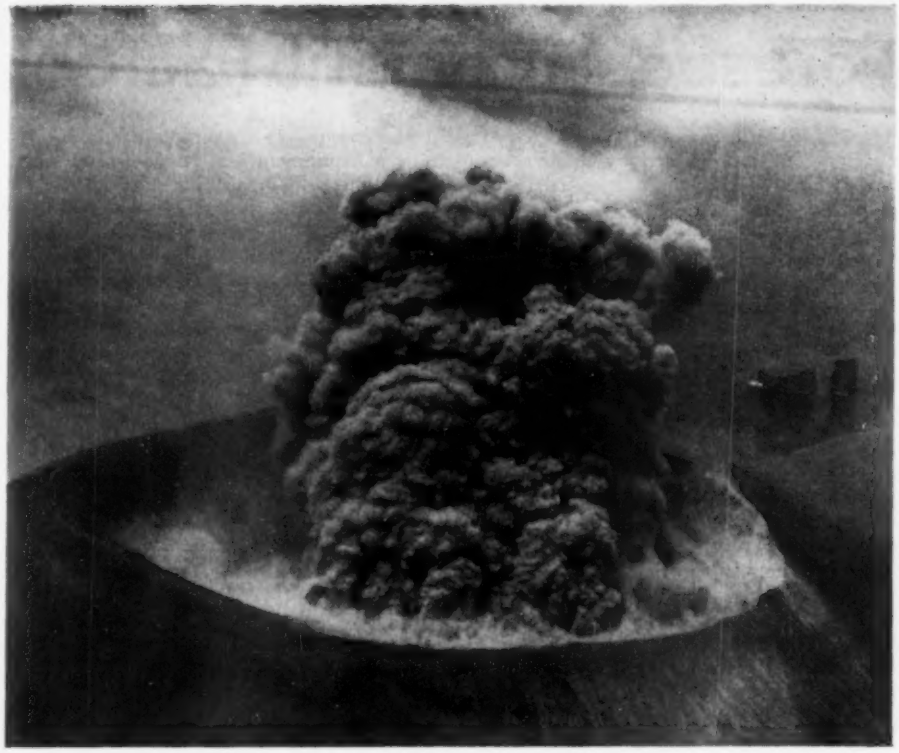

FIRST HISTORICAL VOLCANO—Smoke billows from the volcano on San Benedicto Island in the Pacific. The photograph shows one of the 20-minute-apart explosions at its maximum.

VOLCANOLOGY

Pacific Volcano Explodes

Credited with "scientific importance out of all proportion to its size," the San Benedicto volcano has erupted, covering the island with yellow ash and changing its shape.

By PEGGY McCABE

Science Service Correspondent at San Diego

See Front Cover

➤ AN EXPLODING volcano on San Benedicto Island, 780 miles south of San Diego, may be the by-product of a huge undersea upheaval reaching from the volcanic Hawaiian Islands to the offshore islands of Mexico, in the opinion of Dr. Robert Dietz, oceanographer with the Naval Electronics Laboratory on Point Loma, Calif.

He flew around the belching saffron-colored cone on the island of San Benedicto Sept. 12. The 1,050 foot crater is now spewing yellow volcanic ash in 20-minute-apart explosions. The flight, in a U. S. Air Force B-29 weather reconnaissance plane, was first in a series sponsored by the Scripps Institution of Oceanography, La Jolla, Calif.

Results are now under study by Dr. Dietz and Dr. H. W. Menard, members of a six-man team of oceanographers assigned by the Navy to study the Pacific sea floor. They are also on the Scripps Institution's staff.

The San Benedicto eruption was credited by the oceanographers with "scientific importance out of all proportion to its scale."

According to a theory advanced by Dr. Menard, the volcano may represent a link in a "fundamental rift zone" on the earth's crust.

Two deep trenches, lying 500 miles apart between Hawaii and Mexico, and pointing directly toward the site of the new volcano were discovered by a Scripps Institution expedition in 1950.

The island of San Benedicto is one of the Revillagigedo group, four lonely barren islands, lying about 225 miles south-southwest of the tip of Lower California.

A California scientist, G. Dallas Hanna, in 1925 studied the islands, and described them in the *Proceedings of the California Academy of Science* (Vol. 15, No. 1, 1926) as volcanic, rising from the deep sea floor, 12,000 feet down.

The observations of the recent airborne expedition, indicating the volcanic activity began in the west and proceeded eastward, check with the 1925 findings.

Clarion, the farthest west, is deeply eroded and obviously the oldest in the group. Roca Partida follows. Socorro, 4,500 feet high, has been active recently, according to Dr. Dietz.

"We were impressed by the recent look of many of the flows there," he said. "They resemble the Hawaiian flows. One of the eruptions looked no more than a few hundred years old. Judging from San Benedicto's present eruption, such outbreaks might go completely unnoticed."

San Benedicto is the easternmost of the islands. The next land to the east is the Mexican mainland, 400 miles away.

In the Hawaiian Islands, the pattern of volcanic activity followed a similar trend, progressing from the oldest islands in the northwest toward the still active volcanoes on Hawaii in the southeast of the group.

Fundamental Rift Zone

"It is likely that the Revillagigedo Islands have formed by eruptions from a single large fundamental rift zone in the earth's crust," Dr. Dietz said.

Enlarging on this, he explained the earth's crust is solid only to a depth of 30 miles. Below this, it is hot and plastic. Large amounts of heat, released by radioactive decay within the earth, cause "convection cells," something like bubbles, to form between the hard crust and the iron-nickel core 2,000 miles deep within the sphere.

When two of these "cells" lie close together, the earth's crust between their tops is agitated, and may be thrown upward in a long, swelling welt across the ocean floor. Finally, the tension along this wrinkle causes fissures, and pressure from below sends lava upward.

The Hawaiian Island Navy sound station at Kaneohe, Oahu, has been picking up an unusually large number of unidentified noises since the end of July. Many of these could come from distant volcanic rumblings.

The ocean is an excellent transmitter of sound, because of its sound channel effect. The Hawaii station has recorded underwater explosions as small as a two-pound charge of TNT detonated off the coast of California.

Many Go Undetected

It is probable that many lava flows take place off the deep Pacific floor, and go completely undetected. However, if the Navy's sound apparatus is able to distinguish between the noises from undersea volcanic rumblings and other distant noises, it may be possible in the future to keep track of such unseen activity. This would be a tremendous step forward in the study of the changing form of the earth's crust.

The new volcano, a beautiful fluted cone, as can be seen from the picture on the cover of this week's SCIENCE NEWS LETTER, has completely changed the shape of the 3-mile-long island. Circling within 200 feet of its summit, through dingy, yellowish clouds with the rotten-egg smell of hydrogen sulfide, the scientists observed that the circular

cone practically fills the gap between the two old peaks on the island. Its growth from a probable level of 200 to 1,050 feet has happened in about six weeks. The crater is 500 feet deep.

Yellowish ash mantles the entire island and each explosion flings huge quantities into the muddied sea water.

"We saw man-o'-war birds and red-tailed tropic birds circling the island, more than somewhat disturbed," said Dr. Dietz. The eruption with its sulfuric ash has evidently destroyed an important nesting place for thousands of these birds.

No Lava Evidence

There was no evidence of lava flows, present or past, the scientists said, and no large rocks seem to have been thrown up lately, though they may have been during the early, earth-breaking stages of the eruption.

Dr. Ruy Finch, volcanologist of Watsonville, Calif., also on the exploring flight, said this volcano is an exception to the general rule of the Pacific. The Hawaiian volcanoes, for example, send forth great quantities of molten lava. They are "well behaved" and quiet. San Benedicto's new crater is of the explosive type. The explosions are occurring regularly every 20 minutes, after which smoke pours out in diminishing quantities.

The presence of hydrogen sulfide "suggests that the eruption may have reached its maximum and be about ready to quiet down," said Dr. Finch, who formerly served the Geological Survey at its Kilauea, Hawaii, laboratory.

Large rafts of pumice were floating near the erupting island. This spongy light-colored material, which can only be formed under water, is exploded lava. It looks like foam rubber. (See p. 199.)

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ELECTRONICS

Foresee Automatic Factory

➤A COMPLETELY automatic factory run by giant "brains" assisted by smaller ones was foreseen during the Centennial of Engineering in Chicago.

Such machines could work out the design of a machine part, punch out this information on a paper tape, then feed the tape to a production machine that would accurately cut the part to the correct shape.

Dr. J. W. McRae, vice-president of Bell Telephone Laboratories, told a symposium on communications and the future that there is today "a real basis" for predicting such machines. They open up the "prospect of relief from human mental drudgery just as the application of power in the industrial revolution gave relief from physical drudgery."

Further, he said, jobs that we cannot now imagine could be done by such machines. There is no need to worry, however, about the possibility that they will take over to rule mankind or that the human mental process will become less efficient.

"None of these electronic brains is a true brain in the sense that none of them can ever have creative thought. They can only," he stated, "do what man has designed them to do and what he has instructed them to do in detail. Man can remain in full control, and he can benefit from a general increase in the intellectual content of his work."

Of great promise in the development of electronic computers are transistors, peasized, rugged devices that do many of the jobs of the vacuum tubes more efficiently and on considerably less power. In one test made, Dr. McRae reported, a 10-to-one reduction in power consumption and in volume of equipment was possible using transistors instead of vacuum tubes.

Such electronic brains will not come into being overnight, he warned, because so much scientific and engineering work will be needed to develop and construct them.

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Mushrooms are one of the most difficult foods to produce profitably.

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MEDICINE

Diagnose Cancer Cells

➤ CANCER CELLS have about twice the amount by volume of nucleic acid in their nuclei as normal cells, scientists at Memorial Center for Cancer, Sloan-Kettering Institute and Cornell University Medical College have discovered.

Better diagnosis of cancer, especially early cancer and pre-cancer, and more knowledge of basic changes from normal to cancer in the cell nucleus are expected as a result of this finding.

The discovery was made by Drs. Robert C. Mellors, George N. Papanicolaou and John F. Keane, Jr.

Measurement of the amount of light that goes through an object, called absorption spectroscopy, is the method that led to the discovery and that will be used on a microscopic level for the expected new cancer detection test.

The new test may prove more accurate that the famous smear test developed by Dr. Papanicolaou because it uses an instrument for measuring, instead of depending on human skill in recognizing cancer cells under a microscope.

Scientists have already found that certain human cancer cells have, relative to normal cells, a two and four times greater volume of the nucleus; a two to four times greater volume of the individual chromosomes; an even multiple of the basic number of nucleoli; even, odd and nonintegral multiples of the fundamental chromosome number, and many structural abnormalities of the chromosome.

In the light of their findings on the differences in nucleic acid content of cancer and non-cancer cells, the scientists state in their report in the journal *Science* (Sept. 12), that, "it is intriguing to think that the nucleic acids themselves may perpetuate these alterations in the cell."

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PHYSICS

Future Atom Smashers

Develop new theory on how to build giant particle accelerators that could deliver atomic "bullets" with energies of 100-billion electron volts.

➤ PARTICLE ACCELERATORS of the future may deliver atomic "bullets" with energies of 100-billion electron volts or more than 30 times greater than those from machines now being built. Much less massive than today's accelerators, they would possibly be built in underground tunnels to protect personnel from deadly high-energy radiation.

A new theory on how to build the machines used to probe the mysterious center of the atom has been developed by scientists at the Brookhaven National Laboratory, Upton, N. Y. Using it, scientists could focus the flying atomic particles into a much narrower beam than is now possible.

Comparatively small magnet sections, rather than the four large quadrants now common, would do the focusing. They would act somewhat like the concave-convex mirror systems used to focus light beams.

One short section of magnet would keep the proton beam on the track vertically, although during the time it was passing through such a section it would spread out radially. The next short magnet section would keep the proton beam on the track radially, although it would then stray up and down. After passing through 480 of such sections for the 100-billion volt machine, scientists would have a finely-focused particle beam.

In each case, the spreading out is more than compensated for by the focusing.

The tube, or "racetrack," of the future accelerator would have a relatively small cross-section. The smaller the dimensions of the tube, the less massive the electromagnet required to guide the particles in their path.

The physicists calculate that a 30-billion volt machine would require a magnet comparable in weight to the 2,200-ton magnet of the cosmotron, which is designed to produce three-billion-volt particles.

The cosmotron magnet units have a cross-section of eight by eight feet, as compared to dimensions of one and a half by two feet for the future machine. However, the diameter of the 30-billion-volt machine—that is the space required for the "racetrack" to be laid out—would be 10 times that of the 60-foot diameter of the cosmotron, and the system of building up the speed of the particles would be more complex.

The same methods could, moreover, be applied to a 100-billion-volt machine, with magnet units having about the same cross-section, and a total weight of 3,600 tons for the 480 units. Its diameter would be 2,060 feet, or nearly half a mile.

Although there are at present no plans for building such a machine, the theory and its possible application are described in two papers expected to be published in *The Physical Review* in December. They are written by Drs. Stanley Livingston of Massachusetts Institute of Technology, Ernest D. Courant, Hartland S. Snyder and John W. Blewett of Brookhaven.

The new focusing theory is based on knowledge gained in operation of the cosmotron, which on May 20, 1952, yielded the first billion-volt atomic particles ever produced by man. (See SNL, May 31, p. 341.) Such particles begin to rival in energy the fragments of atomic nuclei found in cosmic rays as they crash into the outer atmosphere of the earth.

By studying the products of such bombardments, scientists can learn new facts about the mysterious forces that hold the particles in the nucleus together. The greater the energy of the bombarding particle, the greater is the fragmentation of the target nuclei; hence the advantage in accelerating particles to higher and higher energies.

By using multi-billion-volt particles as "bullets," it is possible to penetrate the neutrons and protons that are the fundamental building blocks of the nucleus, to transmute one type of particle into another, to change energy into nuclear particles and to reveal new fundamental properties of matter.

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TECHNOLOGY

Turbine to Establish Temperature Record

➤ A STEAM-DRIVEN turbine that will drive a 145,000-kilowatt generator is being built in Schenectady, N. Y., to operate at record steam temperatures.

The new turbine will have steam at 1,100 degrees Fahrenheit pushing against its shiny new blades with a force of about 2,350 pounds per square inch. The steam will be generated in a boiler capable of burning coal, gas or oil.

High temperatures and pressures are attractive to electric utilities because these conditions give the companies more for their money. High temperatures create high-pressure steam that can be run through a turbine several times. The higher the boiler steam pressure is, the more often the steam can be reused.

Glenn B. Warren of General Electric's turbine division said the unit now under construction is the first of two scheduled for the Kearny plant of the Public Service Electric and Gas Co. of Newark, N. J.

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HIGHEST STEAM TEMPERATURE—This generator rotor will be turned by a turbine that operates with the highest steam temperatures ever used for this purpose. Thirty-two feet long and weighing 100,000 pounds, General Electric reports it will operate at 1,100 degrees Fahrenheit.

CHEMISTRY

New Process Fertilizers

Economical production of more concentrated plant food foreseen from fertilizers made by new methods, in one of which phosphoric acid replaces the usual sulfuric acid.

➤ FERTILIZERS WILL be made by new processes for economical production of more concentrated plant food, the American Chemical Society was told at its meeting in Atlantic City.

Production of ammoniated phosphorus fertilizer in an alkaline solution is a novel process described by Dr. Louis E. Andres of Potasse & Engrais Chimiques, Paris.

Use of phosphoric acid to replace all or part of the more usual sulfuric acid, now in short supply, and at the same time to aid in by-product uranium recovery was described by L. D. Yates and F. T. Nielsson of the Tennessee Valley Authority and E. J. Fox and R. M. Magness of the U. S. Department of Agriculture.

Increased amounts of ammonia are incorporated into phosphate fertilizer without loss of material in insoluble form in the French alkaline process of Dr. Andres. This can be done by addition of ammonium citrate if small amounts of magnesium salts are put into the mix.

The Atomic Energy Commission's request that more phosphoric acid be manufactured to aid in uranium recovery as a by-product from fertilizer manufacture has stimulated experiments by the Department of Agriculture and TVA on improved uses of phosphate rock. Phosphoric acid is used to make higher grades of superphosphate fertilizer, for which increasing demand is noted.

Another development in fertilizer manufacture reported to the meeting is partial replacement of sulfuric by nitric acid in making superphosphate, described by David McKnight, J. F. Anderson, Jr., M. M. Striplin, Jr. and T. P. Hignett of the Tennessee Valley Authority, Wilson Dam, Ala.

Fertilizer for areas where magnesium is needed in the soil, but sufficient nitrogen is available, is produced by melting rock phosphates with magnesium and potassium sulfates in a new process described to the meeting by G. L. Bridger and D. R. Boylan of Iowa State College, Ames, Iowa.

Improvement of mixed fertilizers by study of the results of adding ammonia in various amounts was reported by F. L. Turbett and J. G. MacArthur of the Spencer Chemical Co., Pittsburg, Kans.

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GENERAL SCIENCE

Science Manpower Short

➤ IT WILL be very difficult or impossible in the next few years to obtain a supply of scientific and engineering personnel equal to the expanded demand brought about by civilian production plus defense requirements.

This was the opinion of the Flemming Manpower Committee when it announced a broad program in an effort to cope with the serious problem. The Flemming Committee advises the Office of Defense Mobilization on manpower problems.

Pointing to a rapidly increasing shortage in the two vital fields, the committee asked industry and government to tighten up on its uses of scientists and engineers, and colleges to shorten teaching programs wherever possible.

Both industry and the Defense Department were asked to make sure that scientists and engineers in their employ are doing jobs making use of their fullest capabilities. In addition, where scientists and engineers are not necessary, the committee asked that sub-professional personnel be assigned.

Only one percent, or 600,000, of the total number now employed in the nation are in engineering or in the biological and physical sciences, the committee pointed out. Nevertheless, on this numerically small but vitally important segment of our manpower depends in very large part our national security and future increases in our standard of living. New discoveries and the development of new techniques of inquiry call for an increasing number of scientific investigators, the committee said.

Besides checking over current utilization of scientific and engineering manpower, industry was asked to help develop new scientists and engineers through expanded fellowship and scholarship programs. In the plants new sub-professional personnel who can do some of the easier jobs for the more qualified men and women could also be trained.

Industry was asked not to conduct any raiding expeditions, and to cooperate with other corporations on utilization of hard-to-get scientist and engineers. Corporations should also utilize scientists and engineers who are members of minority groups to the fullest extent, the committee urged.

High schools that do not teach the subjects required for entrance into engineering schools were asked to do so, while engineering schools were asked to make special provisions for students with an aptitude in engineering who have not completed the required courses.

Government agencies were asked to strengthen their programs of information and reports on specific shortages of scientific and engineering personnel. In addition they were urged to cooperate with industry and colleges on training programs.

The committee urged continuance of present policies on college student deferment and on deferment of scientists and engineers in the reserves who are working on essential projects.

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BIOCHEMISTRY

Vitamin A to Protect Arteries of Diabetics

➤ DIABETIC PATIENTS in the future will be getting extra doses of vitamin A to protect their arteries if a research finding reported to the American Chemical Society meeting in Atlantic City proves true for humans as well as laboratory rats.

The finding is that rats with diabetes cannot convert carotene into the vitamin as efficiently as normal, non-diabetic rats can. Carotene is the yellow-colored chemical in carrots and other plants which humans as well as rats and other animals convert into vitamin A by body chemical processes.

If diabetics cannot convert the yellow pigment into the vitamin, this may have something to do with the hardening of arteries which comes on prematurely in diabetics, it is suggested.

In reporting their discovery, Drs. Albert E. Sobel and Abraham Rosenberg of the Polytechnic Institute of Brooklyn and the Jewish Hospital of Brooklyn state:

"The discovery that the conversion of carotene to vitamin A is impaired in experimental diabetes can be regarded as the first step toward the discovery of an agent to control the premature aging of the arteries (arteriosclerosis) found in individuals suffering from diabetes mellitus."

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ASTRONOMY

U. S.-Made Planetarium Is Featured at Swiss Fair

➤ AN AMERICAN-MADE planetarium is being featured at the Swiss National Fair, Comptoir Suisse, now being held in Lausanne.

Installed in a special domed chamber, the planetarium will project the skies as seen from almost anywhere on earth at any time in the past, present or future.

The instrument, manufactured at the Spitz Laboratories in Philadelphia, is the first American-made planetarium ever to be opened to the general public in Europe. Until recently, all such instruments, including a few in the United States, were made in Germany.

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HIGH-SPEED AERIAL CAMERA—To enable photo pilots to sweep in, take their pictures and fly out more quickly than at present, a new high-speed aerial camera, the Cax-12, has been developed by the Fairchild Camera and Instrument Company for the Navy. Here, Comdr. Murlin W. Alley, director of the photographic division of the Navy's Bureau of Aeronautics, holds the magazine, which uses 70 mm film, while Fred P. Wilcox, Fairchild's vice-president, holds the lens cone and points to the unique speed shutter which is his invention. The camera controls are on the table.

CHEMISTRY

Mixtures for Fabrics

➤ IN THE future, our suits and dresses, our stockings and underwear will be made out of complicated mixtures of natural and synthetic fibers.

This is the opinion of Dr. Milton Harris, one of the nation's leading fabrics researchers, given in Chicago, when he was there to address a symposium on "Looking Ahead With the Chemical Industry," a feature of the Seventh National Chemical Exposition.

The next few years will see a slowing down in the introduction by the chemical industry of new synthetic fabrics, Dr. Harris said. Rather, the industry will explore new uses for the fabrics already invented and experiment with "alloys" of several kinds of synthetic and natural fibers.

Dr. Harris himself was wearing a pair of socks made of an experimental blend of cashmere and nylon. They have all the softness of cashmere, he said, yet they will wear ten times longer than pure cashmere socks. For years, he pointed out, the wool and cotton industries thought addition of other fibers "diluted" their product. Actually, they added to the value of the natural fibers. Up to now, blending of fibers has been merely an art, Dr. Harris said. Now it is getting to be a science with controlled experiments being conducted.

Literally thousands of new fabrics are sitting on the shelves of the chemists, Dr. Harris said, most of them only slightly different from those already commercially available. One large chemical company alone has thought up in the past two years about 600 types and modifications of fabrics.

Asked about the theoretical chances of producing a fabric that would never wear out, never stain, never wrinkle, such as the fictitious fabric of the "white suit" of a recent movie, Dr. Harris said such a "fabric" would not be a fabric at all, but some kind of an inert material. These are the qualities of something like a diamond, he said, not a cloth.

Yet, if women would consent to wear nylon stockings about four times thicker than the sheer stockings presently in style, he declared, they would almost never wear out. Of course, he pointed out, women will not wear such coarse stockings.

The exposition was held in connection with the Centennial of Engineering.

Science News Letter, September 27, 1952

GEOLOGY

Land Once Bridged South America and Africa

➤ A BROAD land bridge probably once joined South Africa and South America, Dr. Kenneth Caster of the University of Cincinnati told the International Geologic Congress meeting in Algiers, North Africa.

That the two continents have always been separate, though connected, contradicts the widely-held theory of "continental drift," which holds that the two land masses were once only one, then slowly drifted apart.

Dr. Caster reached the separate-but-once-joined conclusion on the basis of the "astounding" similarity in certain geological features that require connecting their histories which are "very similar, if not identical." At their nearest point, the two continents are now about 1,800 miles apart.

Science News Letter, September 27, 1952

CHEMISTRY

Plants Tear Down Sugar In Storing Sun's Energy

➤ HOW PLANTS build up complicated sugars only to tear them down again in the process of photosynthesis was told by Dr. Melvin Calvin of the University of California to the American Chemical Society meeting in Atlantic City.

Phosphorus provides the clue to the way plants build water, oxygen and carbon dioxide into sugar and starch. This is not a straightforward chemical synthesis, but is accomplished by a round-about process which Dr. Calvin and his associates are following by use of the radioactive forms of these key elements.

Sugar containing phosphorus and seven carbon atoms, instead of the six in ordinary plant sugars, is built up and broken down, these researches show, in a cycle that constantly renews a supply of chemical groups ready to combine with carbon dioxide from the air with the aid of energy drawn from sunlight.

Science News Letter, September 27, 1952

OCEANOGRAPHY

2-Mile Undersea Peak Discovered in Pacific

➤ AN UNDERWATER mountain peak rising more than two miles (12,192 feet) from the ocean floor was discovered during the 14,580-mile Pacific cruise of the research vessel, Horizon, recently returned to La Jolla, Calif. The new seamount is 1,200 miles west of Acapulco, Mexico.

Fishes that live a quarter mile deep below the sea's surface, below where sunlight reaches, were dredged up. These included extraordinary numbers of young lantern fish. Another discovery was floating pieces of pebble-sized volcanic pumice inhabited by minute marine creatures. (See p. 195.)

Science News Letter, September 27, 1952

MEDICINE

Women Smaller Because Hormone Stunts Growth

➤ THE REASON women are smaller than men is that the female, or estrogenic, hormone has a growth-suppressing action.

Studies suggesting this were reported by Prof. W. S. Bullough of Sheffield University at the meeting of the British Association for the Advancement of Science in Belfast.

The female hormone exerts its growth-suppressing effect through its stimulation of the adrenal gland to produce hormones similar to cortisone. These hormones depress the rate of energy production and have a powerful action in checking replacement of skin cells and suppressing growth in general.

The male hormones do not seem to cause any extra production of cortisone-like hormones, so the growth of men and other male mammals is not suppressed.

Prof. Bullough's studies were made on skin in an effort to learn more about cancer. Anything that causes rapid cell replacement, he concludes, may help in producing tumors. Included may be factors such as over-eating, on the one hand, or hormones such as the estrogenic substances.

The appearance of cancer in mice may be entirely prevented by forced dieting, he reported, but it has not yet proved possible to eliminate it by hormones.

Prof. Bullough's studies were made under the auspices of the British Empire Cancer Campaign.

Science News Letter, September 27, 1952

ELECTRONICS

International Television May Foster World Peace

➤ INTERNATIONAL TELEVISION broadcasts may foster world peace by carrying bits of culture from nation to nation, helping people to understand people.

E. W. Engstrom, vice-president of the Radio Corporation of America, told a communications symposium of the Centennial of Engineering in Chicago that modern transportation and military advances have brought nations "uncomfortably close together" in a nearness that threatens destruction.

But television programs on an international level, he said, could spread friendship and understanding throughout the world and might act as an antidote to the threat of war.

Mr. Engstrom painted a rosy picture of television's possibilities. Commercially, it already has jumped to a $3,000,000,000-a-year business. In five years, about 50,000,000 video sets will be in operation, he estimates.

Aside from its commercial applications, television is finding other uses. It has been used in business conferences when men participating in the meetings were scattered over many hundreds of miles. It has given medical students close-up views of complex operations. Adapted to ultraviolet light, it has shown biologists things they could not see otherwise.

Its applications to education have only begun. Mr. Engstrom foresees a "pattern of adult education that surmounts evening classes and correspondence courses in convenience and effectiveness."

In addition to its practical applications, television has "cross-fertilized" other fields.

Science News Letter, September 27, 1952

BIOCHEMISTRY

Blood Plasma Extenders Needed to Save Lives

➤ CHEMISTS WERE called upon to develop plasma extenders to save the lives of victims of a major catastrophe by Dr. I. S. Ravdin, professor of surgery of the University of Pennsylvania Hospital, at the meeting of the American Chemical Society in Atlantic City.

Obtaining enough blood and plasma would be difficult as there is no absolutely safe method of sterilizing blood, he said. Both blood and plasma can transmit a virus that causes an acute inflammation of the liver, called homologous serum jaundice.

Because of the danger of a major disaster, such as atomic bombing, Dr. Ravdin told the chemists that there must be consideration of various plasma extenders, as the dextrans, PVP or polyvinyl pyrrolidone, and the gelatins which can be made in unlimited amounts and stored for unlimited time.

There is now a considerable likelihood that red blood cells can be stored for as long as nine months in the frozen state and still live as long as freshly-shed blood when injected into the veins, Dr. Ravdin explained, although this is not possible for whole blood.

Science News Letter, September 27, 1952

ENTOMOLOGY

More Potent Insecticide Safer for Humans, Pets

➤ AN ARSENIC insecticide more potent against many pests than chemicals now used has been synthesized and is undergoing field tests here and abroad, Dr. Roland M. Kary of the American Smelting and Refining Co., Barber, N. J., told the American Chemical Society meeting in Atlantic City.

Called Compound A-42, it is an organic arsenic substance, chemically, arsenomethane As-1,2 disulfide. It is expected to be less harmful to human beings and animals than the poisonous inorganic arsenicals used as insecticides.

A little of A-42 goes a long way in killing insects. Five parts in 10,000 kill termites. A tenth of one percent dose kills granary weevils, and one percent kills carpet beetles. For Japanese beetles, a five percent dust formula is used.

Science News Letter, September 27, 1952

IN SCIENCE

BIOCHEMISTRY

Chemical to Keep Blood Fresh Longer

➤ A CHEMICAL that promises to allow human whole blood to be preserved for longer periods than now possible was reported by Dr. Otto Schales of Tulane University at the meeting of the American Chemical Society in Atlantic City. The chemical, not yet clinically tested, is dimethylamino-isopropyl-phenothiazine.

It was developed on the theory that an enzyme action similar to digestion of food in the stomach works on the red blood cells, and so weakens them that they cannot withstand the stress of circulation in the body after 21 days storage. Cells treated with the phenothiazine compound were stored for seven weeks and were no more fragile than fresh red cells.

Science News Letter, September 27, 1952

PALEONTOLOGY

Find Fossil Bone of Largest Bird Known

➤ A FOSSIL bone of the largest bird known to fly has been found in Nevada, Dr. Hildegarde Howard, chief curator of science at the Los Angeles County Museum, has reported.

A wrist bone, it belonged to a huge vulture that lived hundreds of thousands of years ago. The bird has been given the scientific name, *Teratornis incredibilis*, to indicate its incredible size. Its wingspread is believed to have been 16 or 17 feet.

Usually a wrist bone is considered unimportant in figuring out what ancient birds were like by studying their fossils. The unusual size of this wrist bone, however, sets it apart from that of any other known bird, Dr. Howard states.

Furthermore, Dr. Howard says, the wrist bone clearly indicates that the bird from which it came was a flier. In the large running birds, such as the ostrich, the wing is reduced and none would have a wrist bone of such size.

The new super-size vulture is a cousin of the *Teratornis merriami*, the vulture that previously held the record of being the largest bird of flight known to science.

The wrist bone specimen is part of an assemblage of Quaternary mammals and birds collected from Smith Creek Cave in White Pine County, Nev., under the sponsorship of the Carnegie Institution of Washington. The Quaternary period includes the Recent epoch in which we now live and the Pleistocene epoch, which began about a million years ago. The bone belongs to California Institute of Technology.

Science News Letter, September 27, 1952

NCE FIELDS

CHEMISTRY

Progress Outmodes Past Pure Chemicals

➤ "CHEMICALLY PURE" chemicals of the past are now antiquated as the result of the growth of atomic chemistry, Dr. Paul C. Aebersold of the Oak Ridge National Laboratory, Tenn., told the American Chemical Society meeting in Atlantic City.

Impurities in such small amounts that they are not recognized by old-fashioned chemical tests can become strongly radioactive when exposed to the atomic pile. This unsuspected source of radioactivity can mislead the analyst who expects to identify a different kind of material by the rays given off.

Better separation methods to give more positive results and consume less time were urged by Dr. Aebersold, who pointed out that more students should be trained in methods of working with radioactive substances.

Refinements of measurement sufficient to spot an ounce of radioactive material in tons of ordinary material, or locate one microgram of it in an elephant, are in use today, according to Dr. Aebersold, who believes that physicists have about reached the limit of sensitivity in constructing measuring instruments.

He called upon chemists to devise cleaner separation methods and more sensitive tests. He urged use of radioactive isotopes of many different elements to trace breakdown products of amino acids, steroids and other chemicals of living matter.

Science News Letter, September 27, 1952

NUTRITION

Figuring Winter Vegetable Supply

➤ IF YOU want your family to be well fed this winter, you had better start now to do some longe range planning. Prices of fresh fruits and vegetables are higher than usual at that time of year, so can or freeze whatever surplus you have from your own garden.

If you do not have a garden, you may be able to watch for good buys at your local market for canning or freezing. The housewife who is doing this for the first time may be at a loss to know how much food to can or freeze.

The amount of space she has to store the food will have to be considered, but apart from that she can figure by the amount of green vegetables needed for one person. Then multiply by the number in your family. Allow one-half the amount for children under six years.

For each adult allow 24 pints of green vegetables if canned, or 24 pounds if frozen, advises Miss Elizabeth E. Ellis, home economist of the University of New Hampshire. Include green snap beans, greens and broccoli among the available green vegetables.

Thirty-six pints of canned tomatoes will provide for a serving four times a week, Miss Ellis figures. Tomatoes may be canned in the form of juice, canned tomatoes or garden relish. Tomato juice may be frozen as well as canned, but whole tomatoes are not successfully frozen.

Twenty-five pints, or pounds, of other vegetables, such as carrots, beets, corn, peas, squash, lima beans or succotash, whether canned or frozen, will provide for a serving at least twice a week. If, in your winter pantry or a cool place, or in the freezer locker, you have stored 85 pints of vegetables in all for each adult in your family, it may help to offset a higher vegetable budget next winter.

Every housewife likes to supplement her vegetable budget with a few jars of crisp pickles, tasty relishes and spiced fruits. These products have little food value. Their chief function is that of an appetizer, the green or red color adding zest to the meal as well as attractiveness.

Science News Letter, September 27, 1952

BIOCHEMISTRY

Drunken Driving Test Checks 24 in 2 Hours

➤ MASS TESTING to detect drunken drivers is the promise of a 25-minute, two-step test reported by Dr. Irving Sunshine and Robert Nenad of Western Reserve University and the Cuyahoga County Coroner's Laboratory, Cleveland, at the meeting of the American Chemical Society in Atlantic City.

As many as 24 persons have been tested within two hours, the scientists reported. In checks for accuracy, it was shown that the method detects as little as two parts of alcohol in 10,000 parts of fluid, either blood or urine, being examined.

The test depends on alcohol turning a solution of potassium dichromate green. In the first step the fluid being tested is put in the outer part of a "Conway" cell. This is a small porcelain apparatus resembling a covered saucer. Two chambers, one within the other, make up the bottom of the cell. The potassium dichromate solution is put in the inner chamber. The whole thing is then heated for 20 minutes at close to boiling, 90 degrees Centigrade.

This evaporates any alcohol present, making it pass into the inner chamber, there to turn the dichromate solution green.

The second step consists of removing the green solution and determining the amount of alcohol absorbed by the dichromate. This can be done either by an electric-eye device or by comparing the green color to that of standard solutions of known alcoholic content.

Science News Letter, September 27, 1952

PHYSICS

Mesons Hold Key To Atomic Hearts

➤ THE KEY to understanding what forces hold the hearts or nuclei of atoms together, one of the basic problems in atomic physics, lies in the elementary particles known as pi-mesons.

These particles bear the same relation to nuclear forces as the photons, or light particles, bear to the electronic and magnetic forces acting between charged particles, Dr. Bruno Rossi, Massachusetts Institute of Technology professor of physics, suggests in the book, "High-Energy Particles." (See SNL, Sept. 13, p. 174.)

Protons, neutrons and electrons are the constituents of matter. Mesons are particles with masses intermediate between those of the electron and the proton. They are unstable and decay spontaneously in much the same way as radioactive atoms.

Even if we knew all about the elementary particles and the laws governing their behavior, we could not apply them to explain the living cell, Dr. Rossi declares.

"Common sense warns us that the properties of complex systems, for example, those that form a living cell, may well be more than the sum of the properties of their ultimate constituents," Dr. Rossi observes. "It is nevertheless true that, since all matter is an aggregate of protons, neutrons and electrons, an understanding of the properties of these elementary particles is a prerequisite to the understanding of the properties of matter."

Science News Letter, September 27, 1952

ZOOLOGY

Radio-Equipped Rats Used to Study Behavior

➤ THE BEHAVIOR of animals apparently varies with the frequency of impulses received and transmitted by the brain, experiments with "radio-equipped" rats by Dr. Joseph A. Gengerelli of the University of California at Los Angeles have shown.

Experimental rats and mice are equipped with tiny antennas that are connected to the animals' brains. Stimulation of the brain by remote control produced varying responses at different frequencies, he reported.

For example, at a low frequency, a rat's whiskers and face muscles vibrate. At a higher frequency, the rat rotates slowly to the left. The performance at each frequency was consistent.

Another interesting observation was that when the flow of current was reversed by rearrangement of receiving equipment, the behavior was reversed. That is to say, a mirror image of performance under the original set-up occurred.

To illustrate: An impulse of a certain frequency might cause the mouse to keel over to the left. When the current was reversed, he would keel over to the right.

Science News Letter, September 27, 1952

ASTRONOMY

Jupiter Shines in East

Four other planets can be seen during month. Six of the first-magnitude stars can also be seen. Milky Way consists of myriads of stars, faint because of their distance.

By JAMES STOKLEY

➤ SHINING HIGH in the eastern sky in the constellation of Aries, the ram, the planet Jupiter is the brightest of the stars or planets to be seen now through most of the night.

Actually, it is a couple of times fainter than Venus, which is in Libra, the scales, and is seen low in the southwest just after sunset as dusk is gathering. Since Venus goes below the horizon about an hour after the sun at the beginning of October, and nearly two hours afterward at the end, it disappears before twilight is entirely over.

Hence, unlike Jupiter, it cannot yet be seen shining brilliantly in a completely dark sky. A few months hence Venus will be in such a favorable position, and Jupiter will then have to take a secondary place.

The position of Jupiter is shown on the accompanying maps, which depict the appearance of the skies at about ten o'clock, your own kind of standard time, at the beginning of October; an hour earlier on the 15th; and two hours earlier on the 31st.

Libra sets before these times. So does most of Sagittarius, the archer, which is the present abode of Mars. This planet, however, may be seen earlier in the evening in this group.

First Magnitude Stars

Mars now is about as bright as a typical first-magnitude star, such as Altair, in Aquila, the eagle, visible in the west. The planet's distinctly reddish color should make it easy to identify.

As for the other planets, Mercury is now an "evening star," which means that it remains above the western horizon for a while after the sun has set. Even by the end of October, however, it will descend out of sight about three-quarters of an hour after sunset, and will be seen, if at all, against a fairly bright sky background.

In October, Saturn is a morning star, appearing in the east before sunrise. About the tenth it will rise with the sun, while by the end of the month, it will precede it by about an hour and a half, rising just as the morning twilight begins.

Vega, high in the west in Lyra, the lyre, is the brightest star of October evenings. In second place is Capella, in Auriga, the charioteer, which is seen toward the northeast. Altair is third, and next comes Aldebaran, in Taurus, the bull. This group is in the east, just to the right of Auriga.

Fifth place is taken by Fomalhaut, part of Piscis Austrinus, the southern fish. Directly south, it is now about as high as we ever see it from these latitudes. The last, and faintest, of the October evening's first-magnitude stars is Deneb, in Cygnus, the swan. This group shines high in the west, just above Lyra.

October is a good time of year to look at the Milky Way. This is the broad path of light that can be seen, when one is away from the glare of city lights, extending from Sagittarius, up through Aquila and Cygnus, and down through Cassiopeia, the chained princess (seen in the northeast and shaped like a letter M tilted to the right), and Auriga to the northeastern horizon.

Binoculars Show Beauty

Look at the Milky Way through a pair of binoculars and you will see, as Galileo discovered in 1610 when he looked at it through his first little telescope, that it is made up of myriads of faint stars that cannot be distinguished with the naked eye. Instead, their light combines to form a continuous glow. These stars are faint because of their great distance, for most of them are many times brighter than the sun.

Also in the Milky Way are dark regions. One of the most famous is in Cygnus, and is called the "coal-sack." This once was thought to be a "hole in the sky," a region devoid of stars, but now we know that it is a dust cloud that obscures the stars beyond.

All the stars that we can normally see, even through telescopes, are formed into a great system called the galaxy, which is shaped like a grindstone. Though displaced considerably from the center, we are within this grindstone of stars.

When we look toward the sides we see relatively few stars, but looking toward the edge there are a great many more, and this is the reason for the concentration in the Milky Way.

There is a great deal of dust in the galaxy; in fact, it has been estimated that there is about as much material between the stars as in the stars themselves. In addition to forming dark areas, where it is silhouetted against the starry background, dust also makes its presence known by a reddening of distant stars.

When the earth's atmosphere has in it great quantities of dust, the light of the setting sun is reddened as it passes through such material. The interstellar dust acts in a similar way, and causes a slight reddening of distant stars, proportional to their distances.

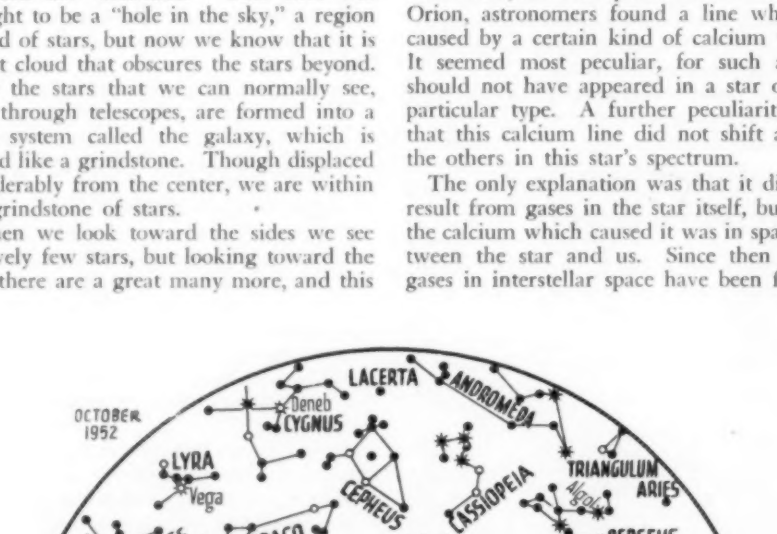
There are also clouds of gas between the stars of the galaxy. Although such gas is highly rarefied, far thinner in fact than in the highest vacuum we can get on earth, the distance that the light of a star has to travel means that it encounters vast numbers of gas molecules on its journey to us.

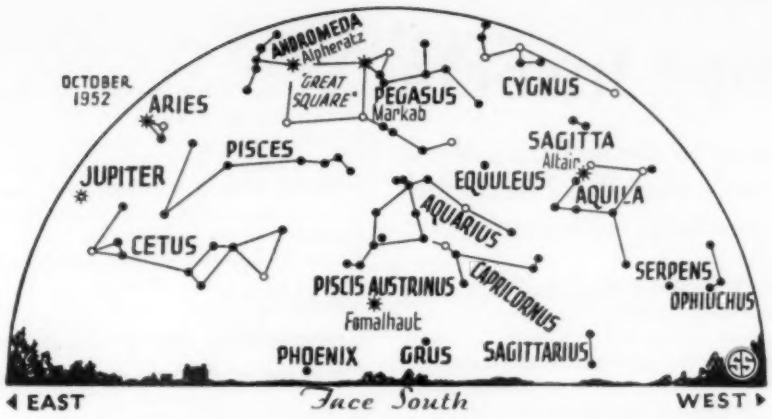
Analyzing star light through a spectroscope, we find that the colored spectrum is crossed by dark lines, each due to the absorption of a certain color, or wavelength, by gases in the star's atmosphere. Also the spectrum tells us about a star's motions. The lines are shifted to the red end of the spectrum if it is receding, and to the blue end if it is approaching the earth.

Gases in Interstellar Space

In 1904, in the spectrum of a star in Orion, astronomers found a line which is caused by a certain kind of calcium vapor. It seemed most peculiar, for such a line should not have appeared in a star of this particular type. A further peculiarity was that this calcium line did not shift as did the others in this star's spectrum.

The only explanation was that it did not result from gases in the star itself, but that the calcium which caused it was in space between the star and us. Since then other gases in interstellar space have been found.





☼ ✷ ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

Hydrogen seems to be by far the most abundant, but sodium, potassium, iron, titanium and cyanogen have also been found. This work is part of a long series of researches that clearly show that interstellar space is not nearly as empty as once thought to be.

Celestial Timetable for October

Oct.	EST	
1	4:26 a.m.	Algol, variable star in Perseus, at minimum brightness.
	8:00 a.m.	Moon nearest, distance 225,100 miles.
3	7:15 a.m.	Full moon.
4	1:14 a.m.	Algol at minimum.
6	5:18 a.m.	Moon passes Jupiter.
	10:03 p.m.	Algol at minimum.
10	2:33 p.m.	Moon in last quarter.
11	3:00 a.m.	Saturn in line with sun.
13	5:00 a.m.	Moon farthest, distance 251,500 miles.
18	5:42 p.m.	New moon.
21	6:07 a.m.	Algol at minimum.
	9:31 a.m.	Moon passes Venus.
24	2:56 a.m.	Algol at minimum.
	5:44 a.m.	Moon passes Mars.
26	11:44 p.m.	Algol at minimum.
29	1:00 a.m.	Moon nearest, distance 228,400 miles.
	8:33 p.m.	Algol at minimum.

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, September 27, 1952

SANITATION

Purifying Drinking Water

➤ HIGH-PITCHED SOUND waves kill germs so effectively that they can be used to purify water and sterilize milk, Miss Lillian A. Russell of the Illinois State Water Supply told the American Chemical Society meeting in Atlantic City.

The sounds used are ultrasound of high intensity and a million vibrations per second. This is far beyond the range of the human ear, which is deaf to any frequency above about 16,000 cycles per second. Ultrasound is made by vibrating a quartz crystal in a high frequency electrical field.

Miss Russell predicted that instruments will be developed that will supply sound sterilization practically in water purification and in the dairy industry.

The waste from atomic furnaces could be used to purify water and sewage by treating them with radiations, Prof. Cecil G. Dunn, Massachusetts Institute of Technology, reported. About a day of exposure to a millicurie of cobalt such as used to treat cancer will sterilize contaminated water.

However, a mere ten seconds of exposure to irradiation from a Van de Graaff generator will do the same cleansing.

Drinking water, swimming pools, and even rivers and sewage could be made safe by such atomic radiations.

For use in mass sterilization of apparatus and material such as would be necessary in germ warfare attack, ethylene oxide can be used quickly and without damage from corrosion, Saul Kaye and Bernard F. Surkiewicz of the Chemical Corps Biological Laboratories, Camp Detrick, Md., reported. Whole rooms can be sealed with plastic films and used as sterilization chambers.

Science News Letter, September 27, 1952

MEDICINE

Acute Leukemia Studied With V.F.W. Grant

➤ TREATMENT OF more children with acute leukemia by chemotherapy will be speeded by a $15,000 research grant made to the Children's Hospital of the East Bay by the Ladies Auxiliary of the Veterans of Foreign Wars, Oakland, Calif.

Dr. Luigi Luzzatti, medical director, and Dr. William B. Chew plan to evaluate further the results of the use of folic acid antagonists, which have been demonstrated to be important in treating acute leukemia, a cancer-like disease of the blood.

Science News Letter, September 27, 1952

ENGINEERING

Machine to Reduce High Price of Eggs

➤ THE HIGH price of eggs may take a tumble, if engineering experiments now under way at the University of California at Los Angeles prove successful.

P. F. O'Brien, assistant engineer, is trying to develop a machine that will eliminate the specialized labor involved in candling or grading eggs.

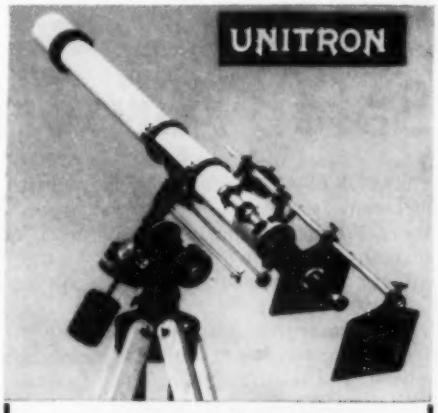
"Much of the high cost of eggs these days is due to the amount of specialized labor involved in candling or grading eggs," Mr. O'Brien points out. "If a machine can be designed to do this automatically, eggs would be much cheaper."

One of the objectives of his research is the design of such a machine. The machine would be designed to examine the internal structure of the egg, which largely determines the egg's grade.

Another important aspect of the study is devising a method to detect Pseudomonos infection, which causes "sour eggs," particularly prevalent on the West Coast.

The infection may be detected in white eggs with ultraviolet light. However, it is extremely difficult to spot it in brown eggs due to the color of the shell. Mr. O'Brien is experimenting with a form of radiation that will cause only the infection to fluoresce.

Science News Letter, September 27, 1952



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CHEMISTRY

Insecticides Tempt Insects

Chinese shrub used for centuries to protect crops from pests yields chemicals from its roots that poison the insects that chew the plants. It is now being successfully cultivated.

➤ THE "THUNDER God Vine," a Chinese shrub used for centuries to protect crops from pests, may yield new insecticides which insects literally cannot resist, Morton Beroza, Department of Agriculture chemist, reported to the American Chemical Society at its Atlantic City meeting.

Transplanted from the Orient, the stocky, twining shrub is now being cultivated successfully in the department's garden at Glenn Dale, Md., and in several other sections of the country.

In tests so far conducted on American insects, the powdered roots of the Thunder God Vine have proved effective against the larvae of the codling moth, the European corn borer and the diamond-back moth. Imported cabbage worms also are killed by the root powder.

"These insects get their food by chewing fruits or vegetables," Mr. Beroza explained. "The insecticide has little or no effect on insects that live on the juices they suck from inside plants. It is therefore a stomach poison and not a contact insecticide. In spite of its toxicity to chewing insects, the insecticide does not appear to be toxic to warm-blooded animals."

The root powder's low toxicity to warm-blooded animals may be an important factor in future research on the resistance which insects build up against insecticides. In general, however, insect killers made from natural sources have not induced such resistance, Mr. Beroza asserted.

Natural compounds, such as those found in the "Thunder God Vine," may prove valuable in formulating so-called "permanent" insecticides that do not require progressively higher concentrations to retain their effectiveness.

Chemists have succeeded in isolating a quartet of closely-related chemicals that provide the insecticidal power of the vine. Found in the bark of the roots, the chemicals, known as wilforine, wilforgine, wilfordine and wilfortrine, have the same basic chemical structure. The names are derived from *Tripterygium wilfordii* Hook, the technical name for the Thunder God Vine.

Science News Letter, September 27, 1952

AERONAUTICS

Safer Airport Promised

➤ AIRPORTS OF the future will have parallel runways instead of intersecting ones under President Truman's recent order to government officials to start at once to carry out the recommendations of his Airport Commission.

Other improvements covered by the order include the wider use of radar traffic control and instrument landing facilities, federal licenses for ports used for interstate transportation, and the separation of military and civilian traffic wherever possible.

The intersecting runways now common on all major airports are provided so that planes may land headed into the prevailing wind at the time. They are no longer essential, because modern heavy transports can land with relative safety in moderately-high cross winds. Light planes, equipped with caster cross-wind landing gear, need no longer land against the wind.

The government offices to which the President's order is directed include the Department of Defense, the Post Office Department, the Civil Aeronautics Board and the Civil Aeronautics Adminstration, in control of all federal civil airports. These include the major airports of the country.

Parallel runways require less land than those with intersecting runways, and high buildings and other structures on their sides are not a serious hazard. However, to provide a greater degree of safety, approach areas at each end must contain no high structures.

The President's Airport Commission recommends that the approach areas be without structures of any sort or with low lying buildings only. It suggests that buildings be banned in a 2.5-mile fan-shaped area extending out from the runway ends.

Radar traffic control is now in use at some of the major airports but should be extended to them all as rapidly as possible. Military training near congested areas provides a hazard and should be eliminated. A further recommendation would put older pilots in command of large transports but younger men at the controls.

Science News Letter, September 27, 1952

BIOLOGY TEACHERS!

You can get better microscopic slides for less! Since comparative histology tells so much about the nature of man, this study should begin early, and be enlarged on in the liberal arts and teachers colleges, and in the university. Like English, it should be a required study for all students in every school of intermediate and higher education. The result would be a better citizenry; better parents, better teachers, better preachers, better physicians, a better man, and a much better society, which is the purpose of education. It should always be borne in mind that nothing can justifiably take the place of knowledge based on truth. Premedical students should make comparative histology their biggest course, because the medical schools devote very little time to study of this most important discipline. The medical students should realize that knowledge of cellular biology gives meaning to pathology, anatomy and physiology and is the natural and least costly approach to all medical problems. *Begin study histology in high school.*

THE AGERSBORG BIOLOGICAL LABORATORY
Centralia, Illinois

SURGERY

Surgeons May Separate Chicago Siamese Twins

➤ ROGER AND RODNEY Brodie, Siamese twins born in Rock Island, Ill., a year ago, will probably undergo a separating operation sometime this fall.

Plans for this were announced by the University of Illinois Research and Educational Hospitals, Chicago, at the same time that the first official report on the physical details of the twins at birth was given by the attending physician, Dr. Samuel P. Durr, Rock Island, in the *Journal of the American Medical Association* (Sept. 13).

Roger and Rodney were and are essentially normal babies except for being joined together at the tops of their heads, with their feet pointing in opposite directions. Together they weighed 11 pounds, 12 ounces at birth and now weigh 36 pounds. At birth, one was 18 inches long, the other 12 and three-quarter inches. Now one is 29 and a quarter inches, and the other 29 inches.

Only two operations to separate such twins have ever been done before, and both resulted in death. However, the University of Illinois specialists who have studied the Brodie twins for 10 months believe surgical separation in their case is feasible.

The twins have separate functioning nervous systems, two brains with no artery connections and two separate brain covering membranes, at least in part. Their mental devolopment is normal for their age and they are trying to crawl by alternately pushing each other. The slight heart murmurs each had at birth have not affected the functions of their hearts.

Science News Letter, September 27, 1952

GENETICS

More Boys Than Girls From Atomic Bombings

➤ THE POSSIBILITY that atomic bombing might upset the sex ratio of the surviving population, resulting in more boys than girls being born, appears in studies by Dr. H. Kalmus of University College, London, and Drs. J. D. Metrakos and M. Silverberg of McGill University, Montreal.

In their studies, reported to the journal *Science* (Sept. 12), they found that irradiation by X-rays of the sex glands of papa mice resulted in births of more males.

Science News Letter, September 27, 1952

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The Annual National Science Talent Search is held each year for seniors in high school who want to compete for $11,000 in Westinghouse Science Scholarships for their college education. Annually 300 are honored. Of these, 40 boys and girls, chosen as winners, also receive a five-day all-expenses-paid trip to Washington, D. C. to attend the Science Talent Institute. Experience in science clubs and participation in science fairs is great practice for those who are planning to compete in the STS when they are old enough.

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Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. books in print, send a remittance to cover retail price (postage will be paid in U. S.) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

ACROSS THE SPACE FRONTIER—Joseph Kaplan and others—*Viking*, 147 p., illus., $3.95. In this field, scientific possibility is more exciting than fiction. Here we learn what scientists plan for the future exploration of space.

AN AUTOBIOGRAPHICAL STUDY — Sigmund Freud, translated by James Strachey—*Norton*, 141 p., $2.50. A new edition of a book that has been out of print for some years.

THE BIRTH AND DEATH OF THE SUN: Stellar Evolution and Subatomic Energy — George Gamow—*New American Library*, 219 p., illus., paper, 35 cents. Telling of the relation between events taking place on the sun and other stars and the threat of future war horrors on earth as well as the promise of better things in peacetime. Originally published by Viking.

THE CHEMISTRY AND CHEMICAL UTILIZATION OF BEECH — George J. Ritter — *Northeastern Forest Experiment Station*, 17 p., paper, free upon request of publisher, Upper Darby, Pa. In chemical make-up this wood is similar to birch and maple. Its ash makes a fertilizer especially useful for growing large potatoes.

DESIGN FOR THERAPY: An Investigation Into the Possibilities of Collaboration Between Psychiatrists and Architects in Developing Basic Information for Mental Hospital Design, Construction and Equipment — Proceedings of a Conference — *American Psychiatric Association*, 80 p., illus., paper, $1.25.

EFFICIENCY OF CRITERIA OF STRESS IN TOXICOLOGICAL TESTS—Henry F. Smyth, Jr., and others—*Mellon Institute*, 5 p., paper, free upon request to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa.

THE EPIGENETICS OF BIRDS—C. H. Waddington—*Cambridge University Press*, 272 p., illus., $7.00. Reviewing research tracing the origin of various parts of the chick in locations on the chick embryo and the cause of various abnormalities in injuries to appropriate parts of the embryos.

FELL'S UNITED STATES COIN BOOK—Jacques Del Monte—*Fell*, rev. ed., 127 p., illus., $1.50. For hobbyists.

THE FORAMINIFERAL GENUS TRIPLASIA REUSS, 1854—Alfred R. Loeblich, Jr., and Helen Tappan —*Smithsonian*, 61 p., illus., paper, 60 cents. The 37 species described include nine new ones. They are from strata ranging in age from Lower Jurassic to Recent.

FOUR LATE PREHISTORIC KIVAS AT POINT OF PINES, ARIZONA—Terah L. Smiley—*University of Arizona Press*, 72 p., illus., paper, 75 cents. Kivas were not believed to exist in this area until they were located through the type of vegetation growing there.

GEOLOGY AND WATER RESOURCES OF PRINCE GEORGES COUNTY—C. Wythe Cooke, Robert O. R. Martin and Gerald Meyer—*Maryland Board of Natural Resources*, 270 p., illus., paper $1.00 cloth $2.00. A report of particular interest to geologists and to residents of the District of Columbia and nearby Maryland.

HANDBOOK OF EMERGENCY DEFENSE ACTIVITIES—Federal Register Division—*Govt. Printing Office*, 119 p., paper, 30 cents. A directory of value to those engaged in the defense program or wishing to do business with those agencies.

HOW TO LIVE WITH HEART TROUBLE—Alton L. Blakeslee—*Public Affairs Committee*, 32 p., illus., paper, 25 cents. Reassuring guidance for heart patients telling them what they can and should not do.

INSIGHT INTO ASTRONOMY—Leo Mattersdorf—*Lantern Press* and *Sky Publishing Corp.*, 223 p., illus., $3.50. The leader of an amateur astronomer's group writes this book for the layman or young persons interested in the wonders of the heavens.

THE LOST DISCOVERY: Uncovering the Track of the Vikings in America—Frederick J. Pohl—*Norton*, 346 p., illus., $3.75. The Kensington runestone was the inspiration that led the author to hunt out the history and myth of the early Norse explorers of America.

MAN IN OUR CHANGING WORLD—Division of History and Anthropology, Los Angeles County Museum—*LACM Bookstore*, 36 p., illus., paper, 35 cents. Describing a museum exhibit giving the facts about race differences and likenesses.

METHODS OF APPLIED MATHEMATICS—F. B. Hildebrand—*Prentice Hall*, 523 p., $7.75. Providing for the engineer or physicist techniques useful to them.

OPERATIVE NEUROSURGERY: With Emphasis on Procedures in Trauma—Elisha Stephens Gurdjian and John E. Webster—*Williams & Wilkins*, 422 p., illus., $10.00. Giving surgeons pertinent anatomic, diagnostic and technical information for certain operative procedures for surgery on the head, spine, sympathetic nervous system and peripheral nerves.

PHYSICS FOR MODERN TIMES—Abraham Marcus—*Prentice-Hall*, 762 p., illus., $4.90. A high-school text designed to give students, including those not planning to go to college, a better understanding of the world they live in.

PLAY WITH LEAVES AND FLOWERS—Millicent E. Selsam—*Morrow*, 64 p., illus., $2.00. A book for children describing plants that open and close their leaves, pop their seed pods or perform other actions.

A PROPOSED GOVERNMENT INCENTIVES, AWARDS AND REWARDS PROGRAM WITH RESPECT TO GOVERNMENT EMPLOYEES — Report of Interagency Working Committee on Incentives, Awards and Rewards—*Govt. Printing Office*, 27 p., paper, 15 cents. Report of a study developing out of the desire to give appropriate recognition to Government employees who have creative ideas.

THE RIGHT WAY TO PLAY CHESS—D. Brine Pritchard—*Emerson Books*, 237 p., illus., $2.50. A clearly written book for beginners in this famous game.

THE RUTGERS FOOD SAVER—Walter A. Maclinn—*Rutgers University Press*, 127 p., $2.95. Tables show in convenient form the best way to keep different kinds of food, the length of time it is safe to keep them, and how to tell whether they are unsafe to eat.

A SOURCE BOOK IN CHEMISTRY 1400-1900—Henry M. Leicester and Herbert S. Klickstein—*McGraw-Hill*, 554 p., illus., $7.50. Original writings of famous chemists from Biringuccio and Agricola to Marie Curie.

SUN, MOON, AND PLANETS—Roy K. Marshall —*Holt*, 129 p., illus., $2.50. A simply written book for laymen.

TAILORING AND DRESSMAKING MADE EASY—S. Palestrant—*Fell*, 159 p., illus., $3.00. A book for beginners. Includes basic embroidery stitches and sections on the care and mending of clothing.

THE UNITED STATES AND THE INTERNATIONAL ORGANIZATIONS—Robert E. Summers, Ed.—*H. W. Wilson*, 194 p., $1.75. Expressions of opinion by many prominent persons are here gathered from various magazines and newspapers to show the various thinking about UN, NATO and other international organizations.

UNITED STATES GOVERNMENT ORGANIZATION MANUAL 1952-53: Revised As of July 1, 1952—Federal Register Division—*Govt. Printing Office*, 742 p., paper, $1.00. A directory of the complicated structure that is the United States Government.

WARWICK AND TUNSTALL'S FIRST AID TO THE INJURED AND SICK: An Advanced Ambulance Handbook—A. P. Gorham, Ed.—*John Wright & Sons* (*Williams & Wilkins*), 19th Ed., 278 p., illus., $1.50. A reference book for teachers and first-aid workers.

Science News Letter, September 27, 1952

The Mathematics Magazine

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Address: Mathematics Magazine Dpt. c 14068 Van Nuys Blvd. Pacoima, California

GENERAL SCIENCE

Army Ordnance Research Office Backs 200 Projects

➤SOME 200 basic research contracts, totaling more that $2,400,000, have been made with universities by the Office of Ordnance Research of the Army during its first year of operation.

Intended to add to the store of the nation's scientific knowledge upon which the arms and the industry of the future will be based, the center is near Duke University, Durham, N. C.

Science News Letter, September 27, 1952

PSYCHOLOGY

No Help From Mental 4-F's

Scraping the bottom of the manpower barrel by drafting those deferred because of their mental condition may not help armed forces much in their search for manpower.

➤ IT WILL not help the armed services as much as you might think to scrape the bottom of the manpower barrel by drafting borderline mental cases.

Even when these men manage to complete their entire three years of military service and receive an honorable discharge, they may nevertheless cause a great deal of trouble while in service.

This is indicated by a careful study of the records of 628 men who were held in an observation ward for study before being sent to a naval training center. Of these, 91 turned out to be mentally sound and were used for comparison purposes in the study. All completed their three years' service. Results are reported in the *American Journal of Psychiatry* (Sept.).

Not only did the borderline mental cases lose more time from duty by having to go to the hospital, but they were more often involved in disciplinary infractions requiring court martial.

The study was made under subsidy of the Office of Naval Research by Dr. William A. Hunt and Mrs. Edna B. Hunt of Northwestern University and Dr. Cecil L. Wittson of the University of Nebraska College of Medicine.

Hospitalizations, they found, ranged from 17.5% for the neurotics to 27.5% for the alcoholics, but strangely enough only one of the alcoholics went to the hospital for alcoholism. Time lost through hospitalization ranged from the neurotics' 807 days to a total of 1,880 for the alcoholics. Only 4.4% of the normals went to the hospital with 104 days lost.

The neurotic is no greater disciplinary problem than is the normal service man, but when he does get into trouble it is because of drinking.

More than a fourth of the schizoid personalities got into disciplinary trouble (26.8%), but it was never because of drinking. Most disciplinary trouble was caused by psychopaths, 62% of whom got themselves involved in trials or courts martial. Of these, 50% went over the hill, 10.3% were drunk on duty and 22.7% were insubordinate.

Science News Letter, September 27, 1952

GENERAL SCIENCE

6% of '51 College Grads Deferred Because of Jobs

➤ ONLY SIX percent of the students who graduated from college in June, 1951, and who are now working have been deferred by Selective Service because of their occupation. Three-fourths of this deferred group majored either in science or engineering, figures from the Office of Education of the Federal Security Agency show.

Part of the "Survey of June, 1951, College Graduates," the report covers the military status and Selective Service classification of only part of the total number of persons included in the full survey, but is believed to be "representative."

Approximately 63% of those sampled are now working, 17% are full-time students in graduate or professional schools and 18% are on active military duty.

Two-thirds of those not on active duty are veterans and, therefore, not eligible for the draft. One percent are unemployed and one percent did not report whether or not they were working.

Science News Letter, September 27, 1952

Do You Know?

Mites of one sort or another are found in every country of the world.

Fluorescent *lamps* are based on a principle learned 100 years ago.

Honeydew *melons* are ripe when the rind has a creamy to yellowish color and a velvety texture when rubbed.

Bones of prehistoric *buffaloes*, found near Lubbock, Texas, show that they were nearly twice as large as the familiar animal.

Although *baking* began with prehistoric man, the past 50 years have produced greater advances in baking technology than the preceding 50 centuries.

Questions

ASTRONOMY—How many planets are visible during October? p. 202.

• • •

CHEMISTRY—How did a laboratory accident lead to the discovery of a waterproofing dye? p. 194.

How have previously "pure chemicals" been outmoded? p. 201.

• • •

MEDICINE—How does nucleic acid aid in the diagnosis of cancer cells? p. 196.

What chemical may be responsible for women being smaller? p. 200.

• • •

PALEONTOLOGY—What is the name of the largest bird ever known to have flown? p. 200.

• • •

PHYSICS—What particles are expected to hold the key to the atom's heart? p. 201.

What new theory has been suggested for building atom smashers? p. 197.

• • •

Photographs: Cover and pp. 195 and 199, U. S. Navy; p. 197, General Electric Company.

VITAL STATISTICS

For First Time in U. S.: More Females Than Males

➤ WAR DEATHS, war brides and a greater lowering of mortality among females than among males have reversed the sex ratio in our population so that we now for the first time in our history have more females than males.

By the end of 1951, there were 986 males per 1,000 females, Metropolitan Life Insurance Company statisticians in New York estimate. By comparison, the figure in 1930 was 1,025 males per 1,000 females. At the time of the 1950 census there were 1,430,000 more females than males.

This trend will continue with the excess of females over males becoming even greater in the future, the life insurance statisticians predict.

Science News Letter, September 27, 1952

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• New Machines and Gadgets •

For addresses where you can get more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N ST., Washington 6, D. C., and ask for Gadget Bulletin 641. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

MINNOW SCOOP dips live minnows from the fisherman's bucket and slides them into a tapering cone-like handle. Fish hooks are inserted through ribs in the handle. Baited hooks are withdrawn through the hinged handle top. Made of a light-weight plastic, the rugged scoop withstands the rigors of outdoor life.

Science News Letter, September 27, 1952

MAGNETIC SWEEPER for floor has a high-powered magnetized tube mounted between two wheels. When rolled along shop floors, the sweeper picks up tacks, nails, nuts, screws and other objects made of ferrous metal. A wiping ring moves from one end of the tube to the other to clean off the tube.

Science News Letter, September 27, 1952

VEGETABLE SLICER has nine parallel blades of rustproof spring steel that are attached to a handle. By drawing the instrument across tomatoes, cooked beets, boiled potatoes, bananas, oranges and other such soft foods, the housewife can make eight slices at once.

Science News Letter, September 27, 1952

WINDOW SHEETS of plastic are cut to the size of the window panes and are squeegeed on the glass, as shown in the photograph. The sheets reduce glare due

to sunlight pouring through office, drafting-room and machine shop windows. Made of a vinyl resin, the sheets are available in shades from "frosted translucent" to "black-out black."

Science News Letter, September 27, 1952

HOT-BOX DETECTORS for railroad car bearings monitor bearing temperatures continuously, and automatically sound a warning when a dangerous temperature rise is detected. Adaptable also to commutators of electrical equipment, the instruments give warning in ample time for corrective steps to be taken.

Science News Letter, September 27, 1952

BED SCALES designed to weigh patients confined to hospital beds consist of a two-by-six-foot board that is slipped under the patient and attached by wires to scales suspended overhead. When the nurse pulls a lever, the patient is raised off the bed slightly. His weight can be read directly from the scale dial.

Science News Letter, September 27, 1952

GAS HEATER for small houses automatically keeps an even room temperature during blustery winter months. Specially designed louvers permit warm air to be blown in several different directions. A switch cuts off the heat in the summer, permitting the unit to be used as a fan.

Science News Letter, September 27, 1952

FLOOR POLISHER for housewives has a quiet electric motor that drives special rotary brushes to polish, scrub, clean, buff or wax floors. The brushes are easily changed for the different tasks. A bumper protects furniture and baseboards from damage should the device strike them.

Science News Letter, September 27, 1952

• Nature Ramblings •

➤ GERANIUMS, BEGONIAS, umbrella-plants, rubber-plants, oleanders, cacti—indeed, practically all of the most popular and easily raised houseplants—really represent a survival of the toughest.

They have to be, to put up with indoor conditions that modern civilized man considers comfortable. Most of our living rooms and apartments are overheated and under-ventilated, and practically without exception the air is kept too dry. We demand that our houseplants put up with the kind of atmosphere we like, and what we like, physiologically speaking, is desert air.

That is bad enough for the leafy tops of our plants. What their roots often have to put up with is worse still: too-small pots, soil with too much clay in it, so that it puddles when over-watered (which it almost invariably is), and either so little of it that the plants half-starve, or so much that water poured on top of the soil runs off and makes a muddy mess underneath.

Here are a few simple suggestions for making life more nearly bearable for your houseplants:

When you first pot them up, use flower-

Winter Company

pots that look much too large for the plants as they are at the moment. Remember, they want to grow, and you want them to grow, and they will grow best if their roots have room, and enough soil to supply at least a minimum of mineral nutrients.

Put a piece of broken flowerpot, or a large pebble, over the hole in the bottom of the pot. Then cover the bottom of the pot with an inch or so of coarse gravel. That is to make for better drainage, and to permit a little ventilation at the bottom of the pot. Roots of most plants need air, quite as much as do their leaves.

Then fill in partly with the soil you are going to use. It should be the best and richest soil your garden affords, with leaf-mold added. If it is a bit on the heavy side, a judicious admixture of fine sand is in order. Firm down gently, but don't pack it tight.

Set your plant on the soil surface, with its roots well spread, and fill in the rest of the soil around it. Do not skimp, but do not overfill. A half-inch below the pot brim is good. Firm the soil down, but again do not push too hard. Trim the oldest, lowermost leaves off, to reduce evaporation surface until the roots have recovered from the transplantation shock.

Set the pot in water, to about a third its height, let the soil absorb for a few minutes, then remove and let stand in the sink for a half-hour or so to drain. Finally, set the pot on its saucer in the sunniest window you have. Do not fuss over your plants too much. Plants, like children, grow best when they are not being over-closely watched.

Science News Letter, September 27, 1952